



**commodore**  
**PET USERS CLUB**  
**NEWSLETTER**

OFFICIAL PET USERS CLUB NEWSLETTER

ISSUE NO. 06

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We like to publish interesting features from PET Users about their applications and set-ups. If you would like to contribute to the next Newsletter, please send your article, letter or comments to:

The Editor,  
Pet Users Club,  
Commodore Systems,  
360 Euston Road,  
London, NW1 3BL.

Please note: to provide a good information service to PET Users, we regularly mention equipment, software and services offered by companies and individuals not directly linked to Commodore. In doing so, we are not making recommendations and cannot be held responsible for the validity of any statements made.

# Commodore News

With the big announcement of several new products appearing last issue we are confined to a number of smaller but useful items of news this time. Incidentally we shall be reviewing in detail the new 2040 floppy disc next issue. One small point that should be noted is that while BASIC programs can be directly transferred from an 8K machine to one of the new 16K or 32K machines some PEEK/POKE statements and machine code routines will have to be re-located. More details of the necessary changes will be published later.

## REPLACEMENT KEYTOPS

Some users have complained that the printing on their keytops has begun to wear off with use. Although the problem is not widespread and should not apply to machines purchased after 1st September, 1978, we are making available sets of replacement keytops priced at £5.00 per set. If you can supply proof that your machine was purchased before 1/9/78 we will let you have a set for £1.00. Prices include VAT. To purchase a set send a cheque/postal order to Commodore (Euston Road) enclosing a stamped addressed envelope.

## EDGE CONNECTORS

If you require edge connectors for any of the PET's Input/Output ports ask your local dealer. He can order direct from us now.

## CIRCUIT DIAGRAMS

In response to pleas from the more technically minded users for circuit diagrams we have decided to make a one-off special offer. This applies to PUC members ONLY and lasts only until stocks run out. Price for the complete set of 11 diagrams is £10.00 inc. VAT. Cash with order please.

## PET MANUAL

A new manual has been printed for the PET and will shortly be available through your dealer priced at £5.00. It is written in a more understandable style and the presentation has been improved considerably. Included is a lot of additional information such as character codes, memory maps and interface specifications.

RENEWAL OF "PET USERS CLUB" MEMBERSHIP

Now that the PUC has been in existence for almost a year the time is drawing near when most members will need to renew their subscriptions to this newsletter.

We have decided to have two entry points in the year - specifically January 1st and July 1st and anyone who joins between those dates is backdated to the last entry point, with appropriate back issues being sent.

Thus, unless you have joined the PUC in 1979 and have not received issue numbers 0 to 4 your membership will expire on JUNE 30th this year.

WHETHER OR NOT YOU CHOOSE TO RE-SUBSCRIBE, YOU WILL RECEIVE ONE MORE ISSUE (NO. 7) IN MAY.

If you want to renew your membership please send a cheque for £10.00 (or £15.00 for an overseas subscription) along with the completed form below to:

The Pet Users Club,  
Commodore Systems,  
360 Euston Road,  
London, NW1 3BL.

In order to avoid a discontinuity in receiving your newsletters, we must have received a payment for next year's subscription by 10th JUNE 1979 at the latest.

PET USERS CLUB  
Membership Renewal Form

Please renew my membership of the Official Pet Users Club for the period 1st JULY 1979 to 30th JUNE 1980

I enclose a cheque/postal order number .....  
to the amount of £10.00 (£15.00 for overseas subscriptions) made payable to:-

Commodore Business Machines UK Ltd.

Name: .....

Address: .....

.....

# Editorial

I have been fairly laden down over the past few weeks with readers' letters and clever programming tricks - regrettably far more than I can publish in this issue. I am gratified to see that users are taking the trouble to write and hence share their discoveries with other people. From the feedback so far however, it seems that what readers find most useful and interesting are the reasonable length routines in a well documented article.

So, if you have a routine that would be of obvious use to many other users (whether your application is in business, science or whatever) why not write it into a short article, giving details of where the routine fits into your application and other situations where it could be invaluable. If you want a good example of this look at Julian Allason's article.

RICHARD PAWSON  
Editor - Pet Users Club

\* \* \* \* \*

Overleaf you will find a questionnaire concerning the use of your PET, software, hardware and your opinion of this newsletter. Although we cannot expect everyone to return the completed form to us, the more we receive, the better will be our knowledge of what Pet Users really require in terms of programs, information etc.

Although it will take us some time to assimilate and condense the replies, we will inform you of the most common answers and our proposed courses of action.

QUESTIONNAIRE FOR PUC MEMBERS

Please answer the following questions and return it to:-

If possible before  
30th April

The Editor,  
Pet Users Club,  
Commodore Systems,  
360 Euston Road,  
London, NW1 3BL.

Q.1 Where did you first hear of the Commodore PET?

Computing press  
National press (inc TV)  
From a PET dealer or  
in the showroom  
From a friend or colleague  
.....

Please tick as  
appropriate

Q.2 What equipment do you have at the moment and what do  
you intend to purchase sometime in the future?

NOW FUTURE

PET  
Commodore printer  
Commodore floppy disc  
Other printer  
Other disc  
Expansion memory  
.....

Q.3 Which of these categories most nearly describes your  
application?

Business/administration  
Education  
Scientific/technical  
Personal/home use

Q.4 More specifically, what do you use your PET for?  
(PLEASE BE BRIEF)

.....  
.....  
.....  
.....

In addition to our own need for good applications articles, we quite often receive requests from national journals asking for the address of a PET user with an application of specific interest to their own readers.

If such a request arose for your application, would you be willing to talk/write to the appropriate person?

YES

NO

If your answer is 'YES' please fill in your name, address and telephone number where you can be contacted overleaf. You can be assured that we will not give out this information other than to serious enquirers.

#### SOFTWARE

Q.5 Of the programs which you currently own and use on the PET, please give an indication of the sources:

##### SOURCE

##### NO. OF PROGRAMS

Commodore Master List (either direct from us or through a dealer)

PETSOFT

Written by yourself or inside your company

Others

Q.6 Have you any comments about the standard of the programs you have purchased?

.....  
.....

Q.7 Have you any suggestions for new programs to be introduced into the Master List? Please give the 3 new titles you would most like to see.

- 1) .....
- 2) .....
- 3) .....

Q.8 PET USERS CLUB NEWSLETTER - which sections in this newsletter do you find particularly helpful and interesting?

Commodore News  
Software  
Peripherals/attachments  
Applications

"Printout"  
Programming  
Users directory and  
announcements  
Readers letters

Q.9 Which of the following possible sections would interest you most?

Book reviews

Specific user group section(business, education etc)

Machine language section

Q.10 Have you any comments or suggestions on how the newsletter could be improved?

.....

.....

---

NAME : .....

ADDRESS: .....

.....

.....

TEL.NO.: .....

---



# Software Notes

First a story: once upon a time a Software Manager received a phone call from a seeming whizz-kid - a macro library for the PET was mentioned and instant tailoring of business programs promised. A meeting was arranged - and a short program written in BASIC demonstrated and a promise to demonstrate a BASIC compiler three weeks later was made. Graham Harris of Costed Automation, I am still waiting - so are others, I gather .....

The first disc has arrived and it has got many interesting features. You can run your own machine code in the controller, eg. "BLOCK EXECUTE:"CH;D;T;S where D = DRIVE (0 or 1); T = TRACK (1 - 35); S = SECTOR (Number of sectors varies from 21 to 17 per track).

Other direct access commands include:

"BLOCK - ALLOCATE:"D;T;S

"BLOCK - FREE:"D;T;S

"BLOCK - READ:"CH;D;T;S

"BLOCK - WRITE:"P;T;S

"BUFFER - POINTER:"CH;PTR PTR = 0 to 255

All commands may be abbreviated "B-F:" or "B-F" etc

"B-A:" or "B-A" etc

OPEN CN, DN, CH, "~~#~~" will open a channel to any available buffer.

OPEN LN, DN, CH, "~~#~~5" will open a channel to buffer 5 where LN = logical file number.

DN = device number.

CH = channel number.

Sequential commands are more familiar -

OPEN14,8,5 "1:file Name, Seq, Write" opens a write channel.

PRINT ~~#~~ 14 will then send characters to the disc.

LOAD is used for programs and the directory. SAVE is also used.

The commands include INITIALIZE, NEW, VERIFY, DUPLICATE, RENAME, CCOPY and SCRATCH. Most reserved words may be abbreviated to a single letter. Channel 15 is used for commands to the controller and for the extraction of error messages.

Lastly, a plea to any of you who have had experience of difficulties with expansion RAM - in particular the effect of suppressing the leading character which is assigned from an INPUT statement if located between 8444 and 8190. Also in Chaining, characterize what is happening with programs which (using LOAD as a last executed statement) pass strings and anyone who has experienced gross effects which may be due to garbage collection during the reassignment of strings.

Also with PME memory expansion has anyone had problems with long machine code loops that sit in the expansion memory.

NICK GREEN

## Master Library Re-packaging and Additions

We have now decided to change our policy regarding games. It is our intention to produce games packages of four or five games per cassette withdrawing games sold as one program per cassette. These will sell @ £10.00 each for Master Library packages and @ £5.00 each for Common Library packages. This issue will cover Master Library releases and the next issue will cover Common Library releases, each being effective on the publication date of each issue.

The following games are to be re-packaged:

|                             |   |
|-----------------------------|---|
| MPØ32 - Backgammon          | This will be included in Treasure Trove of Games 6  |
| MPØ1Ø - Othello             | This will be included in Treasure Trove of Games 5  |
| MPØ11 - Pontoon             | This will be replaced by an improved game called Blackjack and is included in Treasure Trove of Games 4 |
| MPØ12 - Wrap Trap           | This will be included in Treasure Trove of Games 3  |
| MPØ13 - Noughts and Crosses | This will be replaced with 3D TIC TAC TOE in Treasure Trove of Games 1                                  |
| MPØ14 - Rotate              | This will be included in Treasure Trove of Games 1  |
| MPØ15 - Lunar Lander        | This will be replaced by a much improved version called OSC Lunar Lander in Treasure Trove of Games 1   |
| MPØ16 - Biorhythms          | This will be a £5.00 pack to be released with Diet Planner.   |
| MPØ17 - Target Pong         | This will be included in Treasure Trove of Games 2  |
| MPØ17 - Off the Wall        | This will be included in Treasure Trove of Games 3  |
| MPØ18 - Galaxy Games        | This will be included in Treasure Trove of Games 2  |
| MPØ19 - Space Fight         | This will be included in Treasure Trove of Games 4  |
| MPØ2Ø - Draw Poker          | This will be included in Treasure Trove of Games 2  |

Note: No new orders for the above games will be accepted but any outstanding orders will be fulfilled.

NEW RELEASES Warning - these games are addictive!

Commodore Treasure Trove of Games 1      £10      Order No MP040

OSC Lunar Lander - one of the all time popular favourites. You must make the Lunar Excursion Module land softly on the moon. By regulating the falling speed, the counter-thrust of the rockets and the amount of fuel required, you should be able to accomplish this objective. If you fail, the marvelous graphics will show the Lunar Lander smashing to the surface of the moon. Difficult at first, but fun to master.

Rotate - is a puzzle on a 4 x 4 grid. The secret is to arrange the letters in sequence in as few moves as possible. Very tough at first. But it can be done.

Wumpus - is a delightful voyage in the imagination, full of fun and quite educational too. You're required to be a detective on a treasure hunt. The clues are all given and you must find the Wumpus, on the basis of these clues, and get him before he gets you.

3D Tic Tac Toe - See if you can beat your PET at this old reliable game.

Commodore Treasure Trove of Games 2      £10      Order No MP041

Jumbo Jet Lander - an exciting aircraft landing simulation in which you the pilot, are invited to land a Jumbo Jet using rate of descent/thrust changes - good graphics.

Target Pong - Insert paddles in the path of a fast moving ball to deflect the ball into a target. The secret is to use the fewest number of paddles and the least time to hit the target just once. It's really much more difficult than it sounds. It requires dexterity and guarantees you fun.

Draw Poker - perhaps we've been minimizing the quality of the superb graphics available in all these programs. But with Draw Poker you have a perfect example of the kind of graphics we're talking about. Here you play Draw Poker against the house with two pair or better to win. And we must give you a warning: the house is a very tough-but-fair-dealer. Of course, the house is your PET. You can vary your bet and see how much you can win (or lose).

Galaxy Games - here are two tough but entertaining games. Both require you to manoeuvre your spaceship while firing at the enemy, and at the same time, to avoid hitting a star. In one game, you're firing at a spaceship that's being piloted by an obviously drunk astronaut! Absolutely no accounting for the gyrations the enemy spaceship is going to take.

Commodore Treasure Trove of Games 3      £10      Order No MP042

Concord Lander - a superb game for simulation buffs. You being the pilot of a Concord landing - in real time - your aircraft on a runway with facilities to droop the snoot, lower the undercarriage, full joystick control (using keypad) and full thrust controls.

Off the Wall - This is the exact opposite to Target Pong.

Wrap Trap - dynamic graphics game in which the player has to trap the computer. Good arcade quality graphics.

Spacetrek - this is the PET version of the familiar game many computer enthusiasts know as Startrek. It consists of two programs. The first is a program that makes good use of graphics to give instructions and the second is the game.

Commodore Treasure Trove of Games 4      £10      Order No MP043  
(8K PET only)

Super 9 x 9 - a machine code 9 x 9 noughts and crosses game that employs full and superb use of PET's graphics with 6 levels of play and complete instructions.

Formula I - another good game for 1 to 4 players. You can select up to 4 different tracks and race against your friends - nice Graphics in this one too.

Blackjack - place your bet and watch your PET deal out the cards as you try to beat the house. Superb graphics on a very entertaining game.

Space Talk and Space Fight - fire missiles at each other in this two player game. But there's a warning: each missile has limited range and if the missile doesn't hit the enemy, watch out! You could run into your own missile and lose ..... and feel very silly. A game for all ages with emphasis on the younger people.

Commodore Treasure Trove of Games 5      £10      Order No MP044

Glider - a superb simulation of a radio controlled glider, you have control over direction and can employ the use of a randomly wandering Thermal to help you land in the landing area.

Awari - PET version of the popular ancient African game using nice graphics.

Othello - Othello is a game of strategy played on an 8 x 8 board, much like a chess board. The object is to surround your enemy and convert the enemy pieces to your side. It's a game where the last moves can be quite decisive. You play against the PET brain.

Reverse - is another game to tax your intelligence and logic. The numbers 1 through to 9 are on the screen in random sequence. The idea is to put these numbers into order in as few moves as possible. Your logical thinking will get quite a work-out.

Commodore Treasure Trove of Games 6

£10

Order No MP045

Backgammon - plays Backgammon against you or against itself. An "aggression" level between 0-12 can be set. Complete introductory instructions included.

Polaris - you are the captain of a nuclear submarine and your mission is to destroy as many tons of shipping as possible but beware, anti-submarine destroyers will seek you out and depth charge you.

Crypto - a Commodore version of the highly popular game of Mastermind employing PET's graphics very well. This should keep you in hours of fun.

Life - a machine code version of Conway's famous game of Life including the the rules and instructions to start.

Commodore Diet Planner and Biorhythm

£5

Order No MP016

Diet Planner determines the ideal weight for your height, your age, sex, and body frame. Should you wish to lose weight, your PET will display the calorie intake required for you to reach your goal.

Biorhythm - will indicate your intellectual, emotional and physical cycles according to a well regarded series of computations based on behaviour.

The Commodore Educational Pack 1

£10

Order No MP046

Helmholtz Coils - a pair of Helmholtz coils are used with an electron beam tube to bend the electron beam into a circle, providing that the B field is known this allows one to calculate e/m for the electron. This is quickly demonstrated in this program by use of the PET graphics up to a separation of 19cm.

Random Decay - simulates a decay process using random numbers. The program plots both linear and log-linear graphs. The latter tending more to a straight line as larger numbers are generated.

Schrödinger - the program treats Schrödinger's method as a simulation where the student has to find the correct value of E (to at least 6 places of decimal). The answers are given as a REM statement at the end of the program.

Momentum 1 and 2 - two tutorials on momentum conversation followed by user-chosen simulated collisions in the first program, and unrestricted choices for the variables of mass and velocity but displaying only one result at a time in the second.

### Commodore Linear Circuit Analysis

£10    Order No MPØ47

The principles of ac circuits can be used to find the currents in any network. However, solving the differential equation pertaining to each network of most practical circuits is often cumbersome. More powerful techniques of ac circuit analysis permit solutions for the circuit currents with much less labour. These techniques are, of course, based on the same differential equation of the circuit. The procedures are written in two programs for linear passive circuit analysis and linear electronic analysis.

### Commodore Mechanics of Materials

£15    Order No MPØ48

The set of programs present the analysis of materials. The fundamental principles of the subject are emphasized throughout. Applications are selected from the various fields of engineering. The topics include statics, stress and strain, beams and framed structures, reinforced concrete and design of steel columns and bolts. Illustrative examples are given to show how to set up a problem and to explain the solution.

### Commodore Linear Programming

£5    Order No MPØ49

The use of graphs to solve linear programming problems is limited to those with only two unknowns. If, for example, there were four variables in a linear programming problem, graphical methods would be of no use. Fortunately, there are algebraic methods for solving linear programming problems and these algebraic methods lend themselves to computer programs. A BASIC program with the corresponding algebraic methods is presented to solve linear programming problems.

### Numerical Analysis

£15    Order No MPØ5Ø

The solution of differential equations - many problems in engineering and science can be formulated in terms of differential equations. Today computers are used extensively to solve the equations of artificial-satellite theory, electrical networks, bending of beams, stability of aircraft and others. The Runge-Kutta methods attempt to obtain accuracy and at the same time avoid the need for high derivatives, by evaluating the function at selected points on each interval. However, local error estimates are difficult to obtain.

+

The solution of non-linear equations - one of the most frequently occurring problems in scientific work is to find the roots of equations of the form  $f(x)$  may be known only implicitly. In general, it is possible to obtain an appropriate solution, relying on some computational technique to produce the approximation. This program produces an interactive method for finding approximations to isolated roots of a function. The method is known as bisection.

Users may care to note that NHI codes D and E are now implemented and many of your helpful criticisms have been implemented to improve the quality of the dialogue. Please note that no tax tables are required with this program.

\* \* \* \* \*

It is our policy to keep all our software under review. New versions of all our leading programs will be brought out from time to time incorporating improvements that have been suggested. All programs with fatal logical errors will, of course, be replaced free of charge if returned direct, with a description of the error, to the Software Manager at Euston Road. For speed of replacement when physical loading problems are encountered, please return to our factory at Eaglescliffe.

Users with a statistical requirement may care to note that amongst many of the titles that we have under consideration at the moment, we hope to add the following to our lists following publication of our next issue. Please do not place any orders with us until release has been announced.

The  $\chi^2$  (Chi-Squared) Test - this statistical method tests if observed results differ significantly from what might be expected to occur.

One-Factor Analysis of Variance - used to test if observed differences among k sample means can be attributed to chance or whether they are indicative of actual differences among the corresponding population means.

The ensuing calculations are laid out conveniently in the ANOVA table.

Two-Factor Analysis of Variance - the one-factor analysis of variance can be strengthened by testing the row effects and column effects independently. This is the two-factor analysis of variance. The program assumes:-  
1 one observation per cell  
2 no interaction between row and column effects - the so-called simple additive model.

Multiple Linear Regression - multiple regression is the extension of simple regression, to take account of more than one independent variable X.

For a set of data points  $(X_i, Y_i, Z_i)$ ,  $i=1, 2, \dots, m$  this program fits a linear equation of the form

$$Z = a + bx + cy$$

by the least square method.

Linear Regression Analysis - an unusually interactive program of multiple application in the laboratory and industry. It performs and displays instantly regression on the line.



# Education Programs

As promised last issue we are printing reviews of several programs available from the newly formed Educational Common Library. Christopher Smith from Queen Elizabeth College, London, is a leading exponent of low cost educational software - especially on the PET. He has given us his opinions on the first few programs and in passing these on, we hope to give you some idea of their range.

Millikan Cell - allows you to run your own experiments, timing the fall of oil droplets under the influence of a chosen electric field so as to calculate the electric charge on the droplets. Nice graphics and can certainly be used in a 'practical' class. Would be improved if the equations used in calculating charge were shown on the screen - perhaps with the values appearing in their right place. Does not prevent division by zero errors.

Random Decay - models radioactive decay by throwing a user-chosen number of dice and progressively removing all sixes. Gives either linear or log plot of this decay and a table. Rather limited: why not extend it to show e.g. rate constant and half decay time ( few students seem to be able to cross-convert these) and perhaps also show square root (n) as a measure of error.

Molecular diffusion - fine animation of Brownian motion allowing choice of number of steps and a numerical readout of these. Excellent basis of a CAL practical but does not guide the student in analysing the data.

Helmholtz - Plots, and gives option of the data, the magnetic field along the axis of a pair of Helmholtz coils. You choose details of the coil size and current etc. to provide genuine CAL opportunities. The plot is rather slow (inefficient nesting of loops). Well worthwhile for its specific task.

Schroedinger - Rather complex demonstration of the need for a whole number of wavelengths to obtain a valid atomic energy state. Would be much helped by graphics and a reminder table of your previous entries and of recommended values.

Hangman - perhaps educational in that it might keep them off the streets: at least it doesn't have, as I've seen elsewhere, bloc dripping from the gallows.

Momentum - provides numeric solution for the impact of two balls of chosen restitution and velocity, together with a linear-style tutorial on the subject. Surely this topic just asks for bouncing graphics? Again it would be nice to tabulate the equations and show their step-wise solution.

Maths (Clark) - a series of programs giving numeric solutions to  
a) a pair of up to 12 x 12 matrices (sum, product, inverse etc.);  
b) vectors, including vector angles; c) trig; and d) integration (trapezium and Simpson's method). Very useful set of programs for both CAL and functional use.

Chagga Farmer - a competition game between two coffee farmers. Good idea but, like snakes and ladders, it gives you little choice and has many pitfalls. However, since the probabilities of the pitfalls are variable (by rewriting program lines) the program could be adapted to make a good project.

Base conversions - interchanges integers of any base (range 2 to 20) to that of any other base. Designed, presumably for class demonstration as the integers are displayed in large character format. This somewhat limits the maximum integer - which is a pity for the program is also of functional use (especially if you happen to have an old computer using 15-bit words).

Enzkin - Adaption of a CUSC program. Initially looks easy but actually provides lots of very worthwhile CAL in trying to optimise the chemical conditions under which a choice of enzymes work. Some of its calculations are amazingly (20 s) slow; it must be possible to do some optimising of its routines too!

Linkover - well-used CAL program by CUSC working out possible sibling outcomes of a specific genetic map. Its calculations can be rather slow - but justifiably. Is a rather specific experiment and you would need the associated book to make full use of it.

Karnaugh mapping (Harrison) - excellent truth table analysis of your chosen logic statement - which can be remarkably long and complex. The descriptive introduction is a separate program whose last function is to load and run the main program - a nice touch.

CHRISTOPHER SMITH,  
Queen Elizabeth College,  
Campden Hill Road,  
London W8 7AH.

\* \* \* \* \*

Still on the educational theme here is a report on the present state of Chelsea Science Simulation Project programs suitable for the PET. Some people have responded to the request for help in converting these programs but more are needed - hence the plea at the end of Bob Lewis' article.

## CAL MATERIALS AVAILABLE FROM CHELSEA COLLEGE

Many readers will know of the CAL projects based at the Centre for Science Education at Chelsea. These take the form of units of teaching/learning materials aimed to assist students in learning about topics in their normal curriculae. They encourage active learning approaches to the sciences, economics and geography and are intended to complement rather than replace traditional resources. Specifically they do not attempt to replace perfectly valid laboratory or field work. The programs are written in BASIC but require no knowledge of either BASIC or computing on the part of either the teachers or the students using them. The interaction with the programs is through a plain English dialogue.

The units comprise three important items:

- students notes or leaflets
- a teachers guide
- one or more computer programs and documentation

The first two items are published by Edward Arnold (Publishers)Ltd\* and the programs are made available through the Educational Computing Section, at Chelsea.

Recently many requests for the programs have come from users of PET micro-computers. Originally the programs were distributed on paper tape but this is not a form suitable for most PET users. In collaboration with Commodore we are pleased to be able to announce the gradual availability of the software on cassette tape adapted specially to run on PETs.

All units have been written by teachers of the appropriate discipline and have been tried out in schools prior to publication. The three components of each unit are interdependent and so it has not been our policy to release programs without the printed documents. Each publication when purchased from Edward Arnold contains a form requesting a copy of the appropriate program(s). Programs are only supplied on receipt of these forms. The cost of each unit has been kept as low as possible by using paper tape as the medium for supplying the programs in machine readable form. Listings are available as an alternative. We are now in the process of building up a complete library on cassette tape but it will be necessary to make a small charge to cover the higher cost of cassettes. This amount must be sent with any program requests, to keep overhead costs down.

Materials from the two projects are currently available from the publisher and it is hoped that PET tapes will be made available for all these in the next few months.

\* inspection copies are available from Edward Arnold (Pubs) Ltd.,  
Woodlands Park Avenue,  
Woodlands Park,  
Maidenhead, Berks SL6 5BS.

### CHELSEA SCIENCE SIMULATION PROJECT

- \* SP 001 LNKOVR - unit on genetic mapping
  - \* SP 002 ENZKIN - unit on enzyme kinetics
  - SP 003 EVOLUT - unit on evolution and natural science
  - SP 004 CMPETE - unit on plant competition
  - SP 005 COXIST - unit on population dynamics
  - SP 006 RKINET - unit on reaction kinetics
  - SP 007 HABER - unit on synthesis of ammonia
  - SP 008 NEWTON - unit on satellite orbits
  - SP 009 INTERP - unit on interference and diffraction of waves
  - SP 010 SCATTER - unit on particle scattering
- Cost of cassette for each program £1

### SCHOOLS COUNCIL PROJECT 'COMPUTERS IN THE CURRICULUM'

- CC 001 BIOLOGY - units on human energy requirements; pond ecology; inheritance; statistics; transpiration; Predator-prey relationships; countercurrent systems.
- CC 002 PHYSICS - units on capacitor discharge; photoelectric effect; gaseous diffusion; mass spectrometer; radioactive decay; planetary motion; gravitational fields.
- CC 003 ECONOMICS - units on international trade; multiplier; fiscal policy; elasticity of demand; price fluctuations; price stabilisation; theory of the firm; banking; monetary policy.
- CC 004 CHEMISTRY - units on chemical equilibrium; rates of reaction; gas chromatography; electro-chemical cells; lattice energy; element gas; contact process.
- CC 005 GEOGRAPHY - units on human population growth; joint-stock trading game; South Eastern railway game; statistics.

Cost of cassettes for each suite of programs to be announced.

Requests for all this software must be made on the forms contained in the packs of written material indicating that a PET tape is required to the address at Chelsea indicated on the forms. A cheque or postal order payable to Chelsea College must be enclosed.

\* available now

## A REQUEST FOR HELP

As you will have read elsewhere in this Newsletter, we are trying to make cassette tapes available to PET users for a range of CAL programs from the CHELSEA SCIENCE SIMULATION PROJECT and from the COMPUTERS IN THE CURRICULUM PROJECT. Many of you will already have the materials and programs and we want others to benefit from your work. This is not a small job and we wish to make the programs available to users as cheaply as possible. However, many hands make light work and perhaps you can help! As with most worthwhile tasks, the rewards are small - an acknowledgement in the program that this is your implementation and, as with contributors to the PET Common Library, a choice of four programs on tape from the Common Library or the CSSP or CC Libraries.

The job is easily defined - to load the existing programs on to your PET and to send a copy of the program on tape to Commodore with a short note on how you implemented it, for example, what changes you were forced to make. You will be sent quite strict guidelines which are intended to insure that your implementation is acceptable to us. It is strongly recommended that you tackle just one program at first and once your style is accepted, you can go ahead with more confidence.

To ensure that everyone does not work on the same program, it will be necessary for you to send a note of programs you are prepared to work on to Commodore. In return you will get a request to go ahead with one (later more) specific programs and a copy of the guidelines I have mentioned. We are looking for high quality programs - efficient, well presented and reliable. Write to us soon, as I know that many people are already getting on with the job. I do hope that you can help us - many thanks in advance.

BOB LEWIS

CONNECTICUT WORD PROCESSOR: A Review (Available from PETSOFT and most  
PET dealers £25 inc VAT)

Several text editing programs for the PET have been circulating in the U K and, to date, none of them has really merited being described as a Word Processor.

The Connecticut Word Processor comes into a different category however. Written by Richard Rosner of the American Interface Manufacturer, Connecticut Microcomputer, the program turns your PET into a powerful text processing system. Originally written to address any RS232C printer through their ADA1200C IEEE-488 adaptor which costs £95, PETSOFT have now produced a second option which allows the program to be used with almost any existing interface/printer combination.

The program can be used for preparing, editing and printing multiple copies of letters, articles, contracts and so on. You start by entering the text in upper and lower case letters. It can then be edited and formatted for final printing.

After the routine is loaded there are just over 2,000 characters of memory free on the standard 8K PET; this is plenty for a full page A4 letter, but more memory may be needed for lengthier documents. Alternatively, the text file can be saved and reloaded.

The comprehensive input and editing features allow you to type in text, delete lines, insert lines between existing lines, carry out substitutions within a line, or replace one line with another. One block of lines can also be moved from one place to another in the text.

Script Directives allow you to vary the output format by setting left and right margins. For example the left margin can be altered for indentation.

Documentation comes in the form of a well written 32 page manual which guides you through the procedure. A special section covers each directive in detail. Sample runs are also provided.

The program itself is well thought-out and considerably extends the range of PET applications. It is interesting to note that the

American 'PET User Notes' is composed using this routine. My only criticism concerns the absence of right hand margin justification. PETSOFT say that they will be releasing a disk-based version which will include this feature.

If you have a printer, you should definitely have this program.

NIGEL WEST

# "Printout"

## 1. A SUBROUTINE LIBRARY.

I copy every useful routine I come across or develop into an indexed notebook. This saves me time and avoids errors when writing the standard sections of my programmes. The 'Templeton' merge, described in the last issue, cuts out the error-prone business of keying in long routines, and makes the compilation of an indexed subroutine library an attractive proposition. Whether or not you use the merge, I strongly recommend that you create an indexed library of your favourite routines.

To add to your library, here are some which have proved useful to me. The shorter ones don't use the merge efficiently, and are best keyed in directly from your notebook.

### 1.1 Right Align.

This is intended mainly for cash columns. Given a value to two places of decimals in Z, then Z\$ (9 chrs) is returned with the value aligned to the right, zero appearing as a single nought.

```
55000 REM---CASH RIGHT ALIGN---
55010 Z$=LEFT$(RIGHT$("          "+
STR$(Z+.005*SGN(Z)),10),9): RETURN
```

### 1.2 Input Trap

This INPUT routine copes with a null return and with commas and also allows editing prior to pressing RETURN. It uses the keyboard buffer to type two quotes followed by a delete after the INPUT question mark.

```
55100 REM---INPUT TRAP---
55110 POKE525,3:POKE527,34:POKE528,34:POKE529,20:
INPUTA$: A=VAL(A$): RETURN
```

### 1.3 Detect SHIFT key up or down.

Adapted from a routine shown me by Andrew Lister working at the Manchester College Of Higher Education, this is a neat way of getting two operations out of one key, one when it's down and another when it's up.

```
55200 REM---DETECT SHIFT KEY ONLY---
55210 WAIT516,1: GOSUB 1000: WAIT516,1,1: GOSUB2000:
RETURN
```



#### 1.4 Branch on 'random' key.

I use this when the program waits for one of many possible single key responses. It saves line after line of IF.....THEN statements.

```
55300 REM---COMMAND DECODE---
55310 Z$="FPLBCTKAcilmtsro": REM FOR EXAMPLE
55320 WAIT525,1:GETC$:FORI=1TOLEN(Z$):Q$=MID$(Z$,I,1)
55330 IFQ$=C$THEN55350
55340 NEXT:GOTO55320:REM INVALID RESPONSE
55350 ONIGOTO1000,2000,3000,4000,5000,
        6000,7000,8000,9000,10000
55360 I=I-10:ONIGOTO11000,12000,13000,14000,15000,16000
```

#### 1.5 Center up text

For a printer opened as file 1 with a line length of X and no TAB facility.

```
50500 REM---CENTER UP PRINT LINE---
55010 FORZ=(X-LEN(Z$))/2TO1STEP-1:IFZ<1THEN5503
55020 PRINT#1," ";:NEXT
55030 PRINT#1,Z$:RETURN
```

#### 1.6 Playing card shuffle

Dr A.K. Jobbings wrote to me from BRADFORD with this very neat shuffle.

```
50600 REM---CARD SHUFFLE---
50610 S$="":P$="*AsKs...2sAhKh...2h
50620 P$=P$+"AdKd.....2dAcKc.....2c
50630 FORA=52TO1STEP-1:B=INT(RND(TI)*A)+1
50640 S$=S$+MID$(P$,2*B,2):P$=LEFT$(P$,2*B-1)
+MID$(P$,2*B+2):NEXT
50650 FORA=0TO51:C$(A)=MID$(S$,A*2+1,2):NEXT
```

O.K., I've shown you mine, now you show me yours! I will include as many as I can in this column.

## 2. Text processor developments.

Now adapted for the IEEE bus, this has been supplied to several interested users. Run-Time formatting parameters are now text-e bedded commands. Price and ordering details as before. It has been used successfully on the SWTP PR40, the AXIOM 801 and the TELETYPE 43. This time, the column was edited and printed using the Golf-ball/IEEE interface from G.R. Electronics which I mentioned last time. Nice one, Cliff and Doug!

### 3. COMPETITION 1 RESULTS.

Nearly 50 entries were received for the first competition. No two solutions tackled the problem in exactly the same way. Only 4 entries failed to do the task correctly. Well done! Many of you indicated how many Bytes your solution occupied, before being run. I judged the entries on the number of Bytes needed to run the programmes, using a common test routine for all entries. Where POKE lower case, PRINT D\$ or RETURN were included, I took them out and also corrected one or two obvious typing or copying errors. The winning entry and the runners up needed no modification, however.

Some of you adopted a straight forward approach, seperating out the various ranges for the four day-number suffixes with IF....THEN statements. Typically, these solutions ran in 300 to 500 Bytes.

The shorter routines used a combination of string manipulation and evaluations of conditional expressions, culminating in this delightful two liner from Ian Brown, of 18 Walpole Road, Surbiton. One of the first entries received, it wins the competition.

```
8 D$=MID$(" JanFebMarAprMayJunJulAugSepOctNovDec",  
M*3,3)+STR$(D)  
9 M=VAL(RIGHT$(D$,1)):D$=D$+MID$("thstndrd",  
(D-M<>10)*(M<4)*2*M+1,2)+STR$(Y)
```

Ian's solution occupies 128 Bytes and runs in 169 Bytes. It destroys the original value in M, but the problem didn't forbid that. (Ian submitted another version running in another 7 Bytes in case it did!)

The runners up were David Abrahamsom of the Department of Computer Science at Dublin University, and P. Austin of 50 Bridge Street, Morley, Leeds. Their (different) solutions ran in 175 Bytes each. Mr Austin was unlucky not to win. By changing the variable A to M in line 20, his program would have run in 168 Bytes.

```
10 D$=MID$("JanFebMarAprMayJunJulAugSepOctNovDec",  
3*M-2,3)+STR$(D)  
20 A=VAL(RIGHT$(D$,1)):D$=D$+MID$("thstndrd",  
1-2*A*(D<4ORD>20ANDA<4),2)+STR$(Y)
```

#### 4. COMPETITION No 2. "Long String"

Searching for a sub-string within a string is not too hard, provided the string is held in one element of an array. If the string stretches across several elements however, things get tricky!

A string of 1020 characters is held in A\$(0) to A\$(3). A sub-string is held in S\$. Write a BASIC program to find matches for S\$ within the long string and display their locations in the following format for each match.

Element No,Chr No within element for 1st chr of match.

You may assume the strings do not contain quote marks. Your solution must cater for matches 'across the joins' between two elements.

The entry which processes my test string and sub-string correctly, IN THE SHORTEST TIME, will win. The prize is a £10.00 voucher for Commodore software. The closing date is three weeks after the official publication date of this news-letter.

With your entry, include the number of jiffies taken to search (unsuccessfully) for matches of a 10 chr substring. You may use line 1 to pre-locate variables etc. The rest of your program must lie in line 1000 onwards.

Thanks for your letters, ideas, encouragement and criticisms. Keep them coming!

Mike Gross-Niklaus,  
25 Longdown Road,  
Congleton,Cheshire.

# Book Review

"Programming the 6502" by Rodney Zaks, published by SYBEX

For many years our own MOS Technology Hardware and Programming Manuals have been held in high regard by digital engineers and programmers working with the 65xx family of microprocessor and peripheral chips. However, when these manuals first appeared, the basic assumption of the publisher was that their readership would be confined to those already familiar with the fundamental concepts of microprocessor design and implementation.

The massive new interest in microprocessors means that the rules have changed somewhat during the half-decade that has passed since MOS Manuals first appeared. The launching of the hardware development board: KIM, followed by PET itself introduced a new type of user anxious to learn to program the 6502 microprocessor at machine code level. Many Pet Users, who starting with no previous computer experience, have successfully used PET as a tool for teaching themselves programming in Basic, approach me with requests for an equivalent of "Basic Basic" for learning machine code.

Until now I have been recommending Volume One of the classic trilogy: "An Introduction to Microcomputers", by Adam Osborne as providing the best tutorial available on the fundamental concepts prior to tackling the MOS manuals. But although Osborne's book is excellent in it's exposition of the general principles, there is clearly a demand by users of systems based on the 6502 for an introductory level text dealing specifically with this microprocessor. Now this missing book has been written by Rodney Zaks, and is available in the U.K.

"Programming the 6502" assumes no previous background, and takes the reader, by step, through the jungle of computer jargon. Basic concepts such as:- creation of an algorithm, flowcharting, binary representation, octal and hexadecimal notations are clearly explained. The same thorough approach continues with sections of the book dealing with 6502 hardware organisation and basic programming techniques - guiding the reader to the point where he can move on to reading the MOS Hardware and Programming manuals with no further assistance.

A special section is devoted to input/output techniques which will be invaluable for anyone intending to use their PET to monitor scientific equipment, or simply run their home or office security system.

Another section gives and explains typical machine code application programs such as getting a character from a keyboard, clearing a portion of memory and finding the largest element of a table (machine code subroutines for sorting can slice minutes off from the execution time of Basic programs.)

The concluding chapters of the book look at the general principles of data structure organisation and program development and serve as an excellent introduction to the more specific books that are available.

All in all this book is a worthwhile investment for anyone contemplating getting involved with machine code on their PET. As a special Users Club offer we have bought 100 (only 100, which will be available on a first come first served basis) copies of the book from Sybex which we are making available at £6.50 from the Euston Road Pet Centre. (add 25 pence for postage and packing if ordering by post.)

A special pack containing the MOS manuals plus "Programming the 6502" is available for £16 (add 40 pence for postage and packing if ordering by post.)

ANDREW GOLTZ

#### EMPLOYMENT OPPORTUNITIES

Commodore Systems is growing rapidly and interesting opportunities are frequently occurring. If you would be interested in working in a challenging and exciting environment please write to us in confidence with your curriculum vitae. Particular areas where we foresee future needs are:

Sales Department (e.g. in our Pet Centre)

Service Engineers

Training Manager

Technical Sales Support

Software Library Organisers

Sales Promotion and Marketing Support

Secretaries

# Applications

I make no apologies for choosing a particularly esoteric application for this issue. While the control of stepping motors is not the commonest use of PET, I have been asked recently by a surprising number of people whether it is possible. Mr. Robertson's article demonstrates that it is not only possible but that the software side of the control is very neat. It puts to very good use PET's versatile language and the powerful IEEE controller. Mr. Robertson, who has recently moved from Holland to England, also sent me details of the software which he uses to program EPROM's via the User Port. Any readers who wish to consult him more fully can contact him via PKS Designs Ltd.

RICHARD PAWSON

## IEEE 488 stepping motor interface

### Introduction

With the advent inexpensive processing, control systems of great intelligence are possible. The IEEE-488 GPIB allows communication with many peripheral units, for all manner of supervisions and control. However, until now the bus lacked wheels and therefore could not more far! The stepping motor interface described will give it this added power thus opening up a whole new area of control.

The reason for the choice of stepping motors as the prime mover was due to PKS Designs Ltd., the manufacturer, being particularly active in this area. Also the stepping motor, being a digital machine, is well suited to digital control.

The stepping motor and drive combination has over the past few years progressed a great deal. Today these units are capable of powers in the order of 2.5kW and shaft speeds of 3000 RPM at 1000 steps/rev. This is a far cry from the small units used in floppy discs.

### OPERATION

Information is transferred via the bus as ASCII characters. These are compiled by the interface to give an index amount at a given rate as follows:-

1. The device address, specifying the interface
2. The axis letter (X,Y,Z). Defining the axis
3. The sign or motion direction. Positive sign, a space or nothing gives positive
4. The move data. Consists of up to 6 numeric characters defining the incremental move in motor steps.
5. An ASCII "@". Used as the character to describe feedrate data
6. The feedrate data. Consists of up to 4 numeric characters specifying velocity in multiples of 10 steps/secs.

A basic control statement may look like this:-

```
10 PRINT # 5, "X-2001 @ 102"
```

This would produce a move of 2001 steps of the X axis motor in the negative direction at a feedrate of 1020 steps/sec.

Having specified a feedrate (@102) subsequent moves will also be at that rate unless another "X@" statement is given. Also an "@" statement may be given during an axis move to change the velocity without affecting the move distance.

The axis letter (X,Y,Z) defines one of three multiplexed outputs. If a simultaneous system is required separate interfaces for each axis drive would be needed.

The IFC control line resets the interface and if it is wished to abort an index controlling the IFC line will give that function.

#### PROGRAMMING

A basic print statement has already been given which will initiate a move. However, how do we know if the move is complete? In the present hardwired interfaces this information is given by the SRQ line being low during index and going high on completion. The positive edge produced may be flagged inside the PET and tested by the program as follows:-

```
1060 W=peek (59426) : poke 59427, 62
1065 Print#5, "X-2001@102"
1070 if (peek(59427) and 128) = 0 goto 1070
```

Line 1060 clears the flag by reading the port and then the interrupt enable is poked for a positive transition. The move is then programmed in 1065, 1070 tests to see if a positive SRQ transition has occurred before program continuation. Line 1070 may be placed some time later if computation is required during the move time. As long as no further print's except "@" occurs before line 1070 no information will be lost. Some may notice that the SRQ destination is not as described in the handbook, the values above are correct. The interrupt flag used here could of course produce a system interrupt if necessary, a machine code program for that is being contemplated.

#### FUTURE DEVELOPMENTS

The hardwired system is at present being implemented with an 8048. This it is hoped will also talk back when asked pertinent questions about status and axis position. This would allow parallel poll and position readout on the fly, if there is time. It would then be possible to control ten interfaces each with these three multiplexed axes. It is a big bus with 30 wheels!

#### USES

As far as the PET is concerned this system would be useful in laboratory environment test systems or maybe hobbyist robots. For use in bad industrial environments the PET would probably suffer and a purpose designed system would be better. However, it may be borne in mind that the motors can be placed tens of meters from the drives with suitable cables, thus making it possible

to place the computer in a protected area.

A.M. ROBERTSON

Supplier: P.K.S. Designs Ltd.,  
40 Nuffield Road,  
Poole,  
Dorset.

## CYTEK (UK) Ltd.

### BASIC TRAINING COURSE

This course is designed for busy people who need to write BASIC programmes now. In three intensive, highly practical days, starting with a foundation of computer concepts, you are taken to the point where you can write useful commercial and technical programmes.

The exercises which you try out immediately on the PET computer allocated to you, make repeated use of the techniques met so far. This immediate and frequent hands-on practice is the best way to learn BASIC. Being residential, you are able to immerse yourself without distraction or interruption. You will emerge possibly exhausted, certainly programming, and with an excellent grasp of practical BASIC.

Your course tutor is Mike Gross-Niklaus. Formerly a training manager with ICL and now installing small business systems, Mike's ability to explain difficult concepts in simple terms and his deep understanding of the problems of the inexperienced programmer have brought him well-earned recognition in the national computing press.

For details contact:-

CYTEK (UK) LTD  
12 Corn Exchange Hall, MANCHESTER 4.  
Telephone:- 061 832 2977



# Peripherals & Attachments

D.A.M.S. Office Equipment Ltd. are manufacturing and distributing (amongst other add-ons) a joystick unit, specifically designed to fit on a PET. Since this is the first of its kind on general sale in the U.K. we decided to review it in the Newsletter.

## DAMS JOYSTICK UNIT

The unit comes as a complete package and consists of the joystick box with appropriate connectors to plug into the PET and a tape with the subroutine for operating it.

The hardware, which seems to be the simple part of the joystick takes its power from the second cassette port and gives its output to two of the data lines on the 8-bit User Port. This rather clever design enables up to four joysticks to be run from the port at the same time.

The software required to operate the joysticks is in machine language and resides in the second cassette deck buffer. The position of any joystick can be read from a BASIC program by means of the USR function so that:

A = USR (1)

puts the value from joystick ~~#1~~ into A. Two short statements in BASIC can convert A into x and y co-ordinates which can then be plotted on the screen or used in calculations. The scaling of these co-ordinates is determined by the contents of a location in the program and hence can be changed over a wide range of values.

Another variable in the program is the number of readings taken from the joystick and averaged to give the position. Broadly speaking the fewer readings taken the faster the BASIC program can be run. More readings however, will give improved stability at the price of slower operation. Once having connected the unit and loaded the routine the joystick is so easy to use that within minutes you can be adapting your favourite games for joystick control. Such an analogue input has more serious uses as well including:

- 1) A system for drawing diagrams and charts quickly
- 2) Moving a pointer or "highlighter" around the screen for editing information.
- 3) A computer version of microfiche storage where PET's screen acts as a window on a large area of data, its position being controlled by the joystick.
- 4) Continuously variable responses for use in psychology tests (a prominent area of use for PET).

In inclusion then, the versatile design of this unit gives it a wide field of applications. Although at £25 the single joystick is somewhat pricey, this can probably be offset by the flexibility of the software and the expandability of the system.

RICHARD PAWSON

# Programming

One way of rendering the STOP key ineffective while running a program is to POKE 537,136. This must be reset if the IEEE bus is OPENed or CLOSEd and has the side effect of stopping TI and TI\$.

\* \* \* \* \*

Some users have experienced difficulty arising from exiting FOR/NEXT loops before they have been fully completed. It is very easy to do this in a subroutine such as the following:

```
10 FOR I = 1 TO 10
20 A = FNZ(I)
30 IF A > 15 THEN RETURN
40 NEXT I
```

This sort of routine can result in NEXT WITHOUT FOR errors later in the program. The following is the correct version of the above subroutine:

```
10 FOR I = 1 TO 10
20 A = FNZ(I)
30 IF A > 15 THEN I=10
40 NEXT I:RETURN
```

\* \* \* \* \*

If you want to handle a large data structure such as an array with more than 256 elements, lower the top of BASIC with POKE 135,16. This is the most significant byte of the 'top of BASIC' address and will make you PET look like a 4K machine. The top of memory is then available for PEEKing and POKEing according to any address system you devise.

\* \* \* \* \*

A useful trick when de-bugging very long programs is to POKE 59490,60. This doubles the listing speed. To revert to normal speed POKE 59490,30.

## MICRODIARY

By Julian Allason of PETSOFT

Amongst the daily mountain of post from PET users there are always a number of request for programs not carried in the current PETSOFT catalogue. These enquiries are logged, and if there seems to be a genuine demand we set about writing a program to match.

One regularly requested title was an Appointment Diary routine. In fact there are several versions published in America; none seemed suitable so I set about preparing a specification. Clearly it should use PET's excellent graphics and reverse field facility to display a full week on the screen. Looking at a number of Desk diaries, we decided that the format adopted by the Economist was the most useful.

The program should ask today's date and from that calculate the correct date for each weekday in the present week and print that on the screen too. That would be relatively easy, I thought. But it was vital that the program stored layouts not just for the present week, but for several weeks ahead, so that they could be recalled and easily amended.

This was the nub of the problem. The program might be used by secretaries with no PET experience; I could not therefore use data tapes or any method which required more effort than writing up an ordinary diary. It would all have to be done by menu selection, that is to say pressing a single key from a choice offered to select the particular option required.

I started by experimenting with a subroutine which would print a line number, a question mark (shorthand for PRINT), and quotation mark down the left hand side of the screen, using the following method:

```
100: B=200 :REM SETS NEW LINE NUMBER STARTING POINT
110  FOR A= 1 TO 11 :REM 22 LINES OF SCREEN DISPLAY TO BE
      STORED (EXCLUDING MENU ON BOTTOM THREE
      LINE)
120  POKE 245, Y:PRINT "↑?"; B; CHR$(34): REM THE POKE COMMAND
      ISSUED AS A VERTICAL TAB. CHR$ (34) IS THE
      QUOTE MARK
130  B=B+10 REM: INCREMENTS LINE NUMBER
140  NEXT A
```

This printed the line number, one position in from the left (position TAB(1)) on account of PET's habit of printing a blank before positive numbers. A Cursor Left would solve this difficulty in all positions except HOME; there is no position to the left of HOME! A little Poking took care of this.

The disadvantages of this method were twofold. Firstly it sacrificed seven precious print positions from the layout of the week: five for the line number etc. to be printed and two at the end. Secondly it required human intervention to hit Return eleven times to include the new lines in the program, and once to execute a GOTO which would restart it.

Cont/.....

Cont/....

- 2 -

There was a solution to the second problem. Although it is not possible to Poke Return directly on the PET, it can be done using the keyboard buffer. Memory location 525 stores the number of keystrokes hit since last checked by a GET or INPUT. Poking a 0 into it will clear the counter.

The buffer can count up to ten keystrokes, so if we Poke locations 527 to 536 with a 13 - the Poke number for Return - the PET will execute ten Returns. If line numbers have been printed on the screen the information will be committed to memory in the form of new line numbers.

Unfortunately the addition of new lines has an unsettling effect on the variables; it resets them to zero. My solution was to display their values on the screen and hit them with one of the auto>Returns, to get them back into memory.

A further side effect was that the subroutine pointers were lost, although this could be avoided by dispensing with Gosubs altogether. By this stage I was drinking a great deal of black coffee and wondering if knitting would not be a more agreeable pastime.

A further difficulty arose. Once the new lines were included in the program they could be selectively called and displayed, but they were printed from the leftmost position (TAB (0)) leaving no room for line numbers to be printed again if further modification was required. Two solutions offered themselves; treating each line as a subroutine to be called consecutively, interspersed with a Cursor right, right, right, right command, or merely listing the relevant lines.

This approach was beginning to look a little inelegant. I abandoned it. Maybe there was another method.

There was, and it is so useful that I would like to share it with you.

PEEKING and POKING scare the daylights out of many first time computer users. They needn't.

Each part of the memory is called a location and has a number. By PEEKING that number you can see what is actually in that particular location. The numbers for PET's screen locations are 32768 to 33767, the former being top left hand corner or HOME, and the latter, bottom right.

The routine I have developed looks at each location in turn by PEEKing it. This gives the PEEK/POKE number for that character - in the case of A the code is 1. So we simply use CHR\$ to turn the POKE number back into a character, right?

Wrong! The numbers used by PET differ from standard ASCII codes. So a conversion is necessary. PEEKing returns the PET's PEEK code. CHR\$ requires the ASCII print number, which may be the same, 64 or 128 more or less than PET print codes; lines 5020 to 5028 implement the conversion.

Cont/.....

```

5000 REM***PAGE PEEK ROUTINE*****
5006 FORSCRN=32768TO33727
5010 PK=PEEK(SCRN)
5020 IFPK<32THENPK=PK+64:GOTO5030
5022 IFPK>64ANDPK<96THENPK=PK+128:GOTO5030
5023 IFPK>95ANDPK<127THENPK=PK+64:GOTO5030
5025 IFPK>127ANDPK<160THENPK=PK-64:GOTO5030
5027 IFPK>159ANDPK<192THENPK=PK-128:GOTO5030
5028 IFPK>223ANDPK<256THENPK=PK-64
5030 CR$=CHR$(PK)
5040 F=LEN(Y$)
5042 IFF=240THENX=X+1
5050 S$(X)=S$(X)+CR$
5060 Y$=S$(X)
5070 NEXTSCRN
5080 PRINTS$(0);S$(1);S$(2);S$(3)

```

Once converted safely to the string CR\$, the character can be added to the string S\$(X). Note that a string cannot exceed 255 characters however. When string length reached 240, I started a new string. Four such strings will hold a whole screenful of information, including the graphics.

The strings can easily be recalled for amendment and manipulated if necessary. Since strings variables are not stored by SAVEing onto tape, it will be necessary to convert them to line numbers or DATA statements, by poking the buffer as suggested above.

And what of the Appointments Diary program? It is selling rather well.....

Julian Allason. PETSOFT

# Users' Directory & Announcements

INTEX (Datalog) LTD have recently announced a new dust cover for the PET. Made from black PVC and tailored to fit over a PET, the dust cover is both rugged and attractive with a white logo over the screen. The price is £4.95 inc. VAT (+ p&p) although Users Club members are given a 10% discount. For further details or trade enquiries ring: 0642 781193

\* \* \* \* \*

A new version of external memory expansion acronamed (Ugh!) PAM has just been released by OMB ELECTRONICS, Riverside, Eynsford, Kent. The CWO price for a 24K unit is £310 + £4.75 carriage. 8K cards are apparently available to plug into the 8K, 16K and 24K standard units. For further details ring: 0322 863567

\* \* \* \* \*

The MICRO COMPUTER CENTRE are now marketing a highly flexible business system using a PET as the central unit. Extra RAM, twin floppies and a teletype printer are standard options. The software is based on their Disk Maintenance Facility Program, which creates, updates, moves and copies random files. This makes possible all forms of book-keeping, stock control, accounts, payroll etc. for a small to medium sized company. For further details or a quotation for your specific requirements contact:

The Micro Computer Centre, Tel. 01-876-0524  
314 Upper Richmond Road West,  
East Sheen,  
London. SW14

\* \* \* \* \*

A PET to teletypewriter 33 interface is available from:

Allen Computers, Tel. 0472-40568  
16 Hainton Avenue,  
Grimsby,  
South Humberside

Options include IEEE or User Port operation and machine language routines for listing. Standard price is £106.00 inc. VAT (CWO).

USERS' DIRECTORY - new entries

Mr. S. Hartley,  
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Systems analysis, business administration routines

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Small business software, consulting, turnkey systems

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Realtime data and laboratory computing. University teaching  
programs.

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Simulation in biology/biochemistry

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Display of chemical formulae and structure diagrams

Raymond d Crossdale  
William Reape Ltd. (Civil Engineers)  
Mayo House,  
Grantley Way,  
Wakefield

Specialised applications software for small businesses

Nicomtech Ltd,  
212 St. Stephens Road,  
Saltash, Cornwall PL12 4NL

Radio amateur interface and software packages to transmit and  
receive morse and radio telex.

# Letters

Please address any letters or comments to:

The Editor,  
Pet Users Club,  
Commodore Systems,  
360 Euston Road,  
London, NW1 3BL.

From Messrs S. Fairman and J Gerson, Brighton College,  
Eastern Road, Brighton. BN2 2AL.

How to stop PET aborting when waiting for input and RETURN is hit

The easy answer is to address the keyboard as device number 0 and accept input from that device. The statement, which can be adapted as need be, is:

```
OPEN 1,0 : INPUT 1 1,X : CLOSE 1
```

\* \* \* \* \*

From Mr. G. Dicker, 39 Bramall Court, Ring Cross Est., Georges Rd.,  
London, N.7.

With reference to the article on page 29 of issue no. 5:

```
10 ? CHR$(PEEK(59227+PEEK(515))OR128*PEEK(516))  
20 GOTO 10
```

This will continue to print any character selected on the keyboard, as long as the key is pressed.

PEEK (515) returns the matrix co-ordinate of the key pressed. This is then added to 59227 which is the start of a table in "BASIC", and the resulting location is PEEKed. This returns the ASCII code.

\* \* \* \* \*